

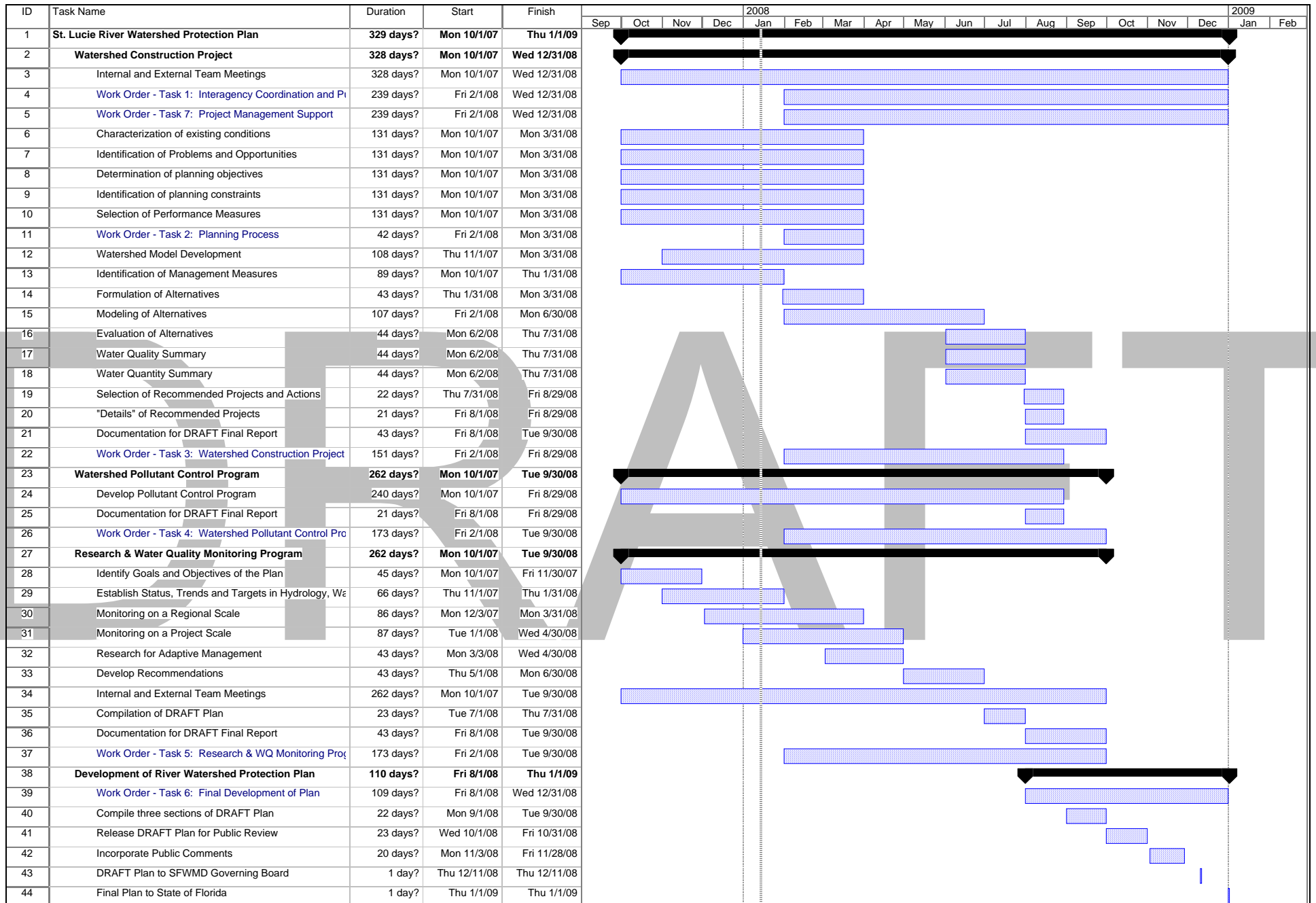
AGENDA
St. Lucie River Watershed Protection Plan
Working Team Meeting #3

Tuesday, January 15, 2008
1330 - 1630

SFWMD Martin/St. Lucie Service Center
780 Southeast Indian Street
Stuart, FL 34997
(772) 223-2600

1. Introduction and Opening Remarks
2. Florida Department of Environmental Protection Update
3. Table of Contents – Final DRAFT
4. Performance Measures – Final DRAFT
5. Summary of Proposed Regional Simulation Model
6. Summary of Proposed Water Quality Spreadsheet Analysis
7. Discussion of DRAFT Management Measure Sheets
8. Public Comment Period*
9. Closing Remarks and Action Items

* As time permits, brief Public Comment Periods will also be held after major discussion items in the agenda




Project: DRAFT_ProjectSchedule_010
Date: Mon 1/14/08

Task  Progress
Split 

Milestone 

Summary 
Project Summary 

External Tasks 
External Milestone 

Deadline 

St. Lucie River Watershed Protection Plan Outline
DRAFT – 01/15/2008

1.0 Executive Summary

2.0 Introduction

- 2.1 Legislation (SB392) and Mandated Plans
- 2.2 Purpose and Scope
- 2.3 Study Area

3.0 Planning Process

- 3.1 Previous studies and ongoing projects
- 3.2 Problems and Opportunities
- 3.3 Plan Objectives
- 3.4 Planning Constraints
- 3.5 Performance Measures

4.0 Interagency Coordination and Public Involvement

- 4.1 Interagency Coordination
- 4.2 Public and Stakeholder Involvement

5.0 Total Maximum Daily Loads

- 5.1 Development of TMDLs for watershed
- 5.2 Basin Management Action Plan Coordination
- 5.3 Recommendations

6.0 Watershed Construction Project

- 6.1 Summary of Management Measures
- 6.2 Water Quantity Analysis Method
- 6.3 Water Quality Analysis Method
- 6.4 Formulation of Alternatives
- 6.5 Alternative Plan Evaluation and Comparison
- 6.6 Planned Projects and Actions
 - 6.6.1 Summary
 - 6.6.2 Plan Features
 - 6.6.3 Real Estate
 - 6.6.4 Operations & Maintenance
 - 6.6.5 Monitoring
 - 6.6.6 Permitting
 - 6.6.7 Implementation
 - 6.6.8 Preliminary Cost Estimates
 - 6.6.9 Funding Opportunities

7.0 Watershed Pollutant Control Program

- 7.1 Non-point source Best Management Practices
- 7.2 Private Lands Grant Programs
- 7.3 Disposal of domestic wastewater residual and septage
- 7.4 Land Application of Animal Manure

8.0 Watershed Research and Water Quality Monitoring Program (Summary)

- 8.1 Introduction
 - 8.1.1 Description of Enabling Legislation
 - 8.1.2 Document Structure
- 8.2 Goals and Objectives of Monitoring and Research
- 8.3 The River and Its Watershed: Status, Trends and Targets in Hydrology, Water Quality and Aquatic Habitat
 - 8.3.1 Delineation of Study Area
 - 8.3.2 Watershed Hydrology and Loading
 - 8.3.3 River/Estuary Salinity, Water Quality and the Related Aquatic Habitats
 - 8.3.4 Salinity Envelopes and Freshwater Inflow Targets
 - 8.3.5 Influence of Lake Okeechobee and Watershed Discharge on Freshwater Inflow to Estuaries
- 8.4 Monitoring on a Regional Scale
 - 8.4.1 Definition of Regional Scale Monitoring
 - 8.4.2 Nutrient Loading and Water Quality Monitoring Program
 - 8.4.3 Freshwater Inflows Monitoring Program
 - 8.4.4 Aquatic Habitat Monitoring Program
 - 8.4.5 Power Analysis
- 8.5 Monitoring on the Project Scale
 - 8.5.1 Definition of Project Level Monitoring
 - 8.5.2 Projects Considered in the Plan (*these are examples at this point*)
 - 8.5.3 Monitoring for Load Reduction- removal efficiency, permit requirements
- 8.6 Research for Adaptive Management
 - 8.6.1 Purpose of Research
 - 8.6.2 Status of Current Research Related to Water Quality
 - 8.6.3 Status of Current Assessment Tools
- 8.7 Recommendations
 - 8.7.1 Recommendations
 - 8.7.2 Plan Implementation

9.0 Recommended Projects and Actions

- 9.1 Watershed Construction Project
- 9.2 Watershed Pollutant Control Program
- 9.3 Watershed Research and Water Quality Monitoring Program
- 9.4 Plan Refinement and Revision

APPENDICES

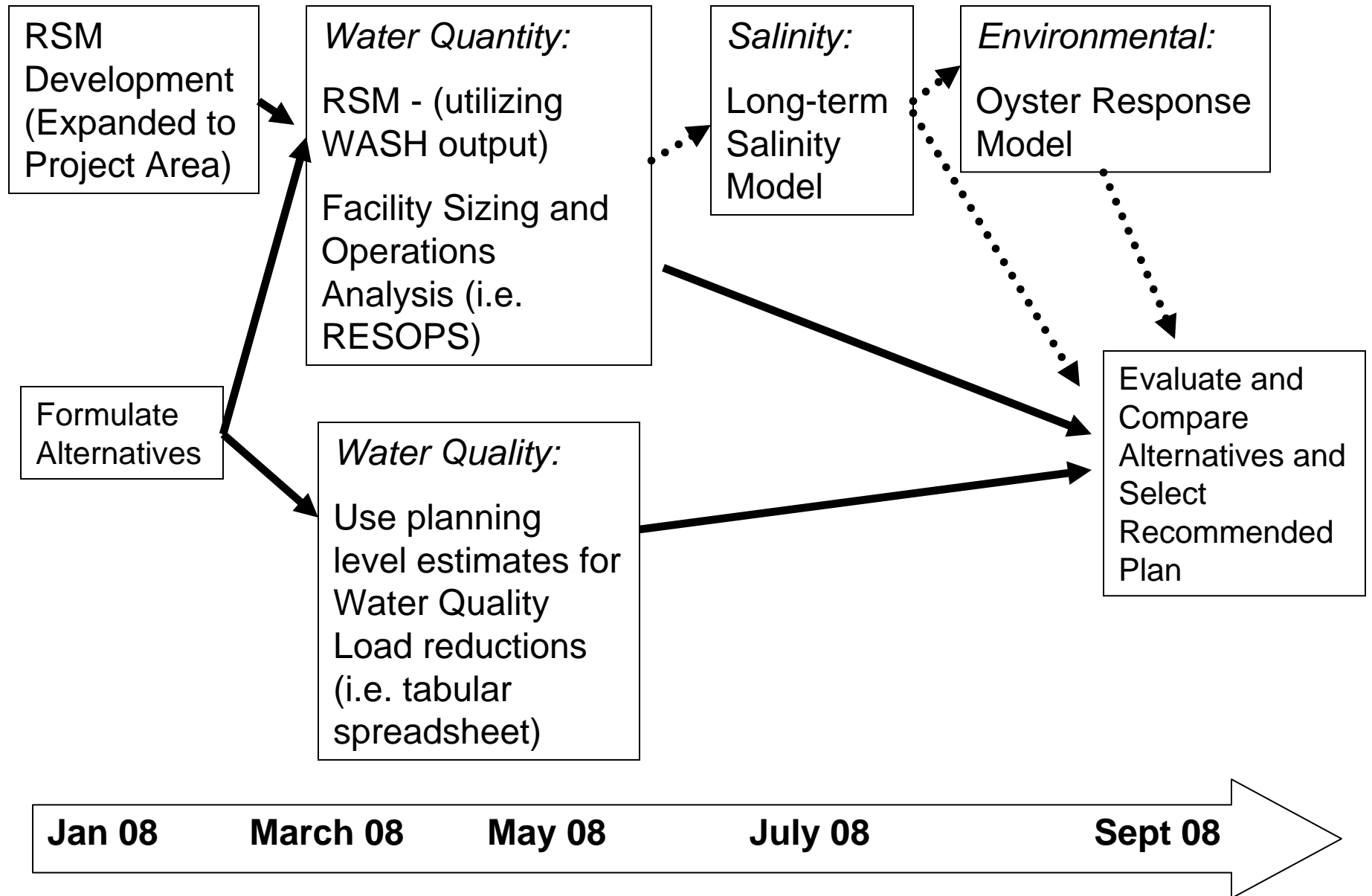
St. Lucie River Watershed Protection Plan
Performance Measures and Indicators
Final DRAFT - 1/15/2008

Problem	Objective	Performance Measure	Target	Comments
Excess discharges resulting from watershed run-off	Manage watershed discharges to meet desirable salinity ranges for estuary	Number of times St. Lucie High Discharge Criteria Exceeded - Mean Monthly Flows between 2,000 and 3,000 cfs		
		Number of times St. Lucie High Discharge Criteria Exceeded - Mean Monthly Flows greater than 3,000 cfs		
Excess Nutrient Loads to river and estuary	Meet Total Maximum Daily Loads	C-23 Basin - Total Nitrogen Load	tbd	FDEP to determine targets through the TMDL efforts
		C-23 Basin - Total Phosphorus Load	tbd	
		C-24 Basin - Total Nitrogen Load	tbd	
		C-24 Basin - Total Phosphorus Load	tbd	
		C-44 Basin - Total Nitrogen Load	tbd	
		C-44 Basin - Total Phosphorus Load	tbd	
		Estuary - Total Nitrogen Load	tbd	
		Estuary - Total Phosphorus Load	tbd	


Problem	Objective	Performance Indicator	Target	Comments
Increased number of undesirable salinity conditions due to little or no flow from local watershed to estuary	Manage watershed discharges to meet desirable salinity ranges for estuary (i.e. supplement groundwater flows as needed with local basin surface water)	Number of times that desired salinity in St. Lucie Estuary (SLE) is not met due to little or no flow from local watershed (i.e. total inflow to SLE including groundwater is less than 350 cfs)		Groundwater inflow may provide the low flow conditions needed to meet desired salinity conditions in SLE; Surface water from local watershed may be needed to supplement groundwater flows if salinity targets not met

- to be determined based on final decision of Period of Record

St. Lucie River Watershed Protection Plan:
DRAFT Proposed Modeling Plan – 1/15/2008



SOUTH FLORIDA WATER MANAGEMENT DISTRICT




Overview of Modeling Approach Used in
the LOWCP Phase II Technical Plan
(presented by Lehar Brion, HESM, SFWMD)

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■ **Modeling Objective**

- determine amount and management of storage needed in 5 sub-watersheds tributary to Lake Okeechobee to:
 - (1) prevent damaging high stages in the Lake and
 - (2) reduce damaging Lake discharges to the estuaries while being able to
 - (3) meet other water-related needs.
- Recommendations from the modeling effort should be compatible with other on-going restoration projects such as the Kissimmee River restoration (KRRP), Lake Okeechobee Protection Plan (LOPP), and Acceler8 projects around Lake Okeechobee, etc.

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2

Overall Modeling Procedure

1. **Select numerical model:** Regional Simulation Model (RSM) as the computational engine using lumped hydrologic modeling approach (water budget, link-node).
2. **Select performance measures (PMs):** Used to compare modeling scenarios (base condition and alternatives).
3. **Establish base conditions:** Starting point in the analysis by which relative comparisons are made.
4. **Identify alternatives:** Combination of management measures that makes up an alternative which, in turn, is translated into RSM as a modeling scenario.
5. **Set-up model, simulate, and post-process:** Process of assembling appropriate model data, running the model and summarizing the output that conforms with performance measures.
6. **Evaluate alternatives in terms of performance measures:** Compare alternatives relative to each other & established targets.

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General Assumptions

- Period of simulation: 1970-2005
- Daily time step
- All elevations are in feet NGVD 1929
- Future base condition (circa 2015):
 - All Acceler8 projects are in place (A-1 EAA reservoir, C-43 reservoir, C-44 Reservoir/STA)
 - Full Kissimmee River Restoration including Kissimmee River Headwaters Revitalization project
- Lake Okeechobee Regulation Schedule: WSE
- For other parts of the system south of Lake Okeechobee: authorized MODWATERs and C-111 projects
- Use of regional trigger that dictates when inflows and outflows for management measures occur

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■ Modeling Domain and Scope

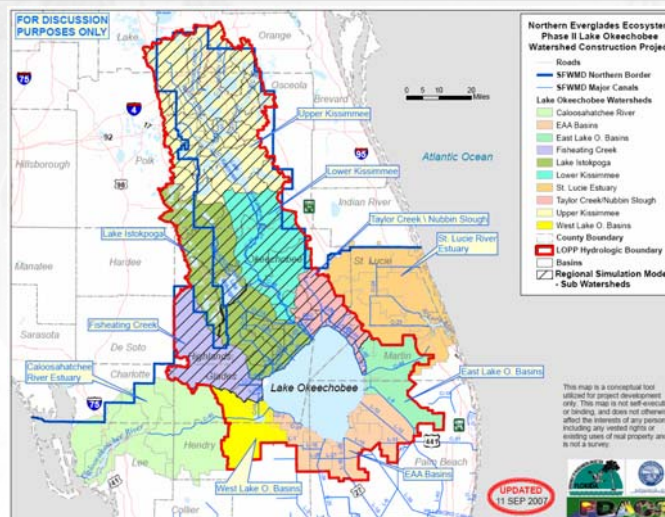
- Spatial extent includes Lake Okeechobee and five sub-watersheds contributing runoff into Lake Okeechobee
 - Upper Kissimmee (KUB)
 - Lower Kissimmee (LKB)
 - Lake Istokpoga (LI)
 - Fisheating Creek (FEC)
 - Taylor Creek/Nubbin Slough (TCNS)
- NERSM = implementation of RSM covering the northern extent of the District down to Lake Okeechobee

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5

■ Modeling Domain



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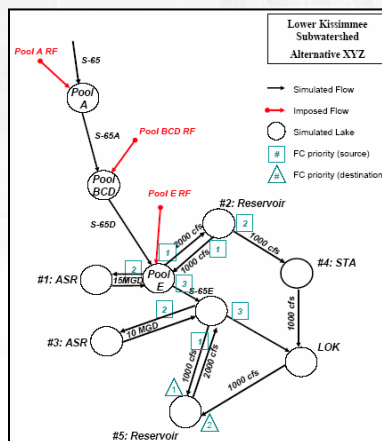
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■ Modeling Domain and Scope

- Lakes in KUB: simulated using UKISS model algorithm
- KUB, FEC, LI and TCNS: modeled as flow pass-through basins; historical inflows were modified based on management measure operating rules
- ACCELER8 reservoirs in the C-43 and C-44 reservoirs: incorporated in the model but no alternatives were defined for these basins
- Sub-watersheds: can be broken down into component basins as nodes that are linked to individual management measures

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Sample Node-Link Representation of a Sub-watershed with Management Measures



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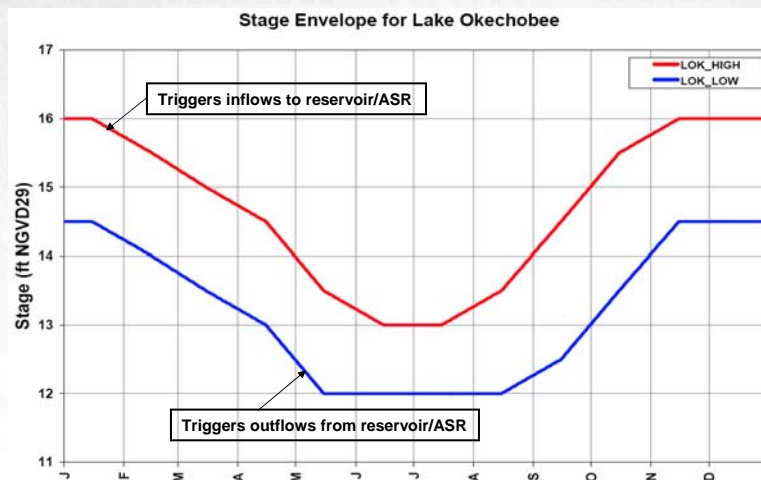
Input Data Requirements

- Each sub-watershed: conceptualized as a single drainage basin with its own rainfall and runoff characteristics
- Boundary conditions:
 - typically defined as time series of flows associated with basin demand and runoff which in turn were
 - obtained from different sources: UKISS simulation for KUB; historical data for LKB; historical flow pass-through for the other three sub-watersheds
- Lake Okeechobee stage envelope: used as regional trigger for controlling when inflows and outflows through proposed reservoirs and ASRs occur

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9



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10

■ Model Output and Post-processing

- Model output:
 - Raw output files are in ASCII and HECDSS formats
 - Daily stages and flows from Upper Kissimmee Chain of Lakes, Lake Okeechobee and each management measure
- Post-processing:
 - Summarize historical flows (if used as boundary condition) and simulated stages, inflows and outflows for sub-watersheds and management measures in order to
 - produce a water budget map
 - incorporate results into different performance measures

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■ Scenario Comparison Using Performance Measures

- Performance measures were used to evaluate alternative plans
- Performance measures were primarily derived from CERP system-wide PMs as generated from the RECOVER (Restoration Coordination & Verification) process.
- For Lake Okeechobee: desired restoration condition is for LOK stage to vary within an “envelope”
 - Extreme low lake stage (11 ft NGVD)
 - Extreme high lake stage (17 ft NGVD)
 - Stage envelope
 - Number of times proposed LOK minimum water level and duration criteria were exceeded

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Scenario Comparison Using Performance Measures

- For Northern Estuaries: restoration goal is to re-establish salinity regimes suitable for the maintenance of healthy, naturally-diverse and well-balanced estuarine ecosystems
 - Number of times C-43 Estuary High Q Criteria Exceeded
 - Number of times salinity envelope criteria NOT met for C-43 estuary
 - Number of times C-44 Estuary High Q Criteria Exceeded
 - Number of times salinity envelope criteria NOT met for C-44 estuary

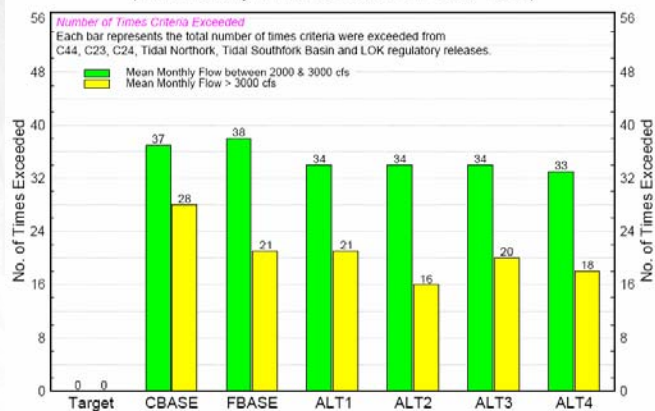
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13

Sample Performance Measure Graphic

Number of Times St. Lucie High Discharge Criteria Exceeded
(mean monthly flows > 2000 cfs from 1970 - 2005)



Note: A favorable maximum monthly flow was developed for the estuary (2000 cfs) that will theoretically provide suitable salinity conditions which promote the development of important benthic communities (eg. oysters & shoalgrass). Mean monthly flows above 3000 cfs result in freshwater conditions throughout the entire estuary causing severe impacts to estuarine biota.

For Planning Purposes Only
 Script used: estuary.scr 10495
 Filename: stuc_2000_flow_bar.out.agr

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14

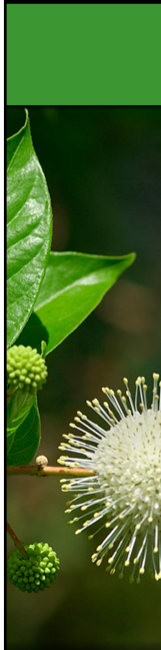
■ Scenario Comparison Using Performance Indicators

- For Lake Okeechobee:
 - stage duration curves and hydrographs
- For Lake Okeechobee Service Area (LOSA): goal is not to impact availability of freshwater for agricultural/ municipal and industrial uses in areas around Lake Okeechobee
 - Water Year (Oct-Sep) LOSA demand cutback volumes (7-worst years)
 - Mean Annual EAA/LOSA supplemental Irrigation: demands and demands-not-met (4-in-1 WS indicator)
- For Entire Modeled System:
 - Annual, Dry Season and Wet Season water budget maps

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- **NORTHERN EVERGLADES main webpage:**
https://my.sfwmd.gov/portal/page?_pageid=2814,19868551,2814_19868565&_dad=portal&_schema=PORTAL
- **NORTHERN EVERGLADES (modeling) website:**
https://my.sfwmd.gov/portal/page?_pageid=1314,2555966,1314_2554335:1314_19826922&_dad=portal&_schema=PORTAL
- **RECOVER website:**
<http://www.evergladesplan.org/pm/recover/recover.aspx>

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Water Quality Analyses

Phase II Technical Plan for Lake Okeechobee Watershed Construction Project

**SLRWPP Working Team Meeting
January 15, 2007**

**Joyce Zhang, Principal Engineer
Lake Okeechobee Division
South Florida Water Management District**

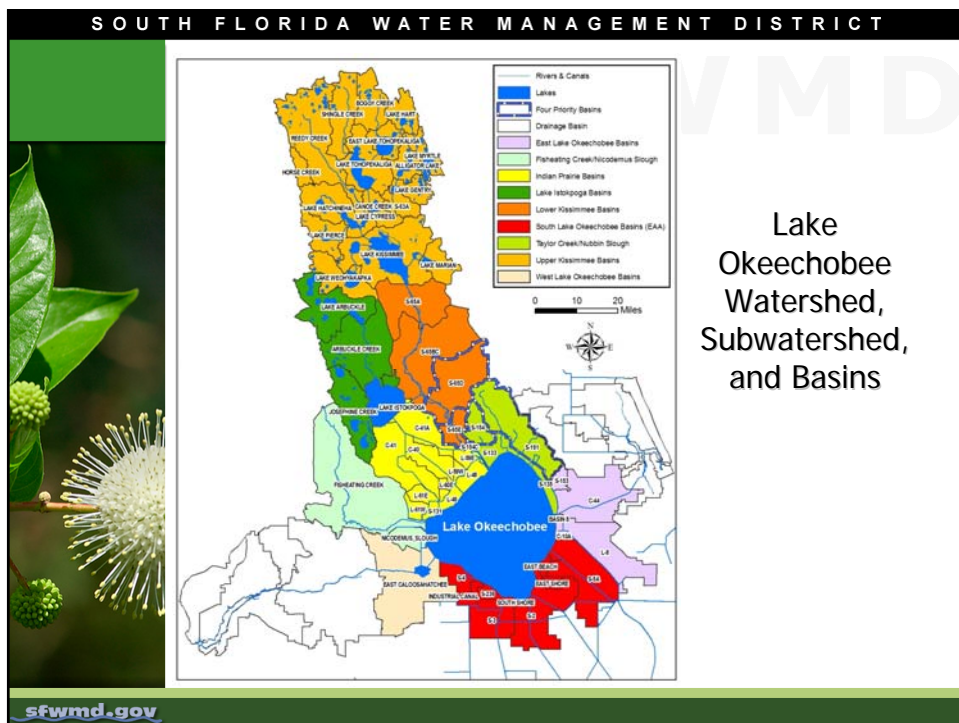
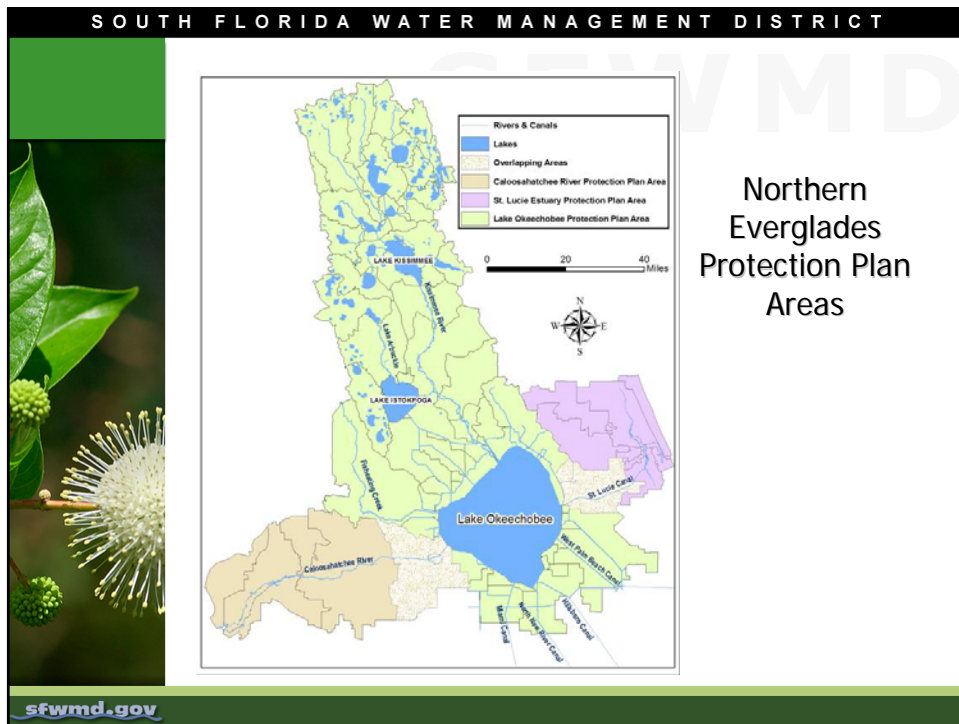
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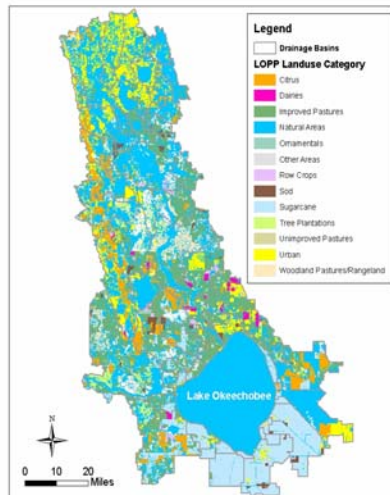


Water Quality Analyses

- Spreadsheet approach to evaluate phosphorus reductions at different spatial scales
- Built upon the 2007 Lake Okeechobee Protection Plan update

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- Updated landuse data in May 2006
- Updated P reduction performance and implementation costs under BMPs in July 2006

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Water Quality Analyses



Table 2. Land use data for the Lake Okeechobee Protection Plan (LOPP) area.

Land Use	Area (acre)		Change
	2006	2003	
Citrus	234,629	209,961	12%
Dairies	22,432	28,121	-20%
Improved Pastures	674,356	693,480	-3%
Natural Areas	1,282,267	1,308,438	-2%
Ornamentals	4,687	4,687	0%
Other Areas	27,567	95,994	-73%
Row Crops	23,157	22,881	1%
Sod	39,081	32,867	19%
Sugarcane	399,710	400,318	0%
Tree Plantations	49,687	52,001	-4%
Unimproved Pastures/Rangeland	324,630	339,967	-5%
Urban	368,884	262,371	41%
LOPP Total Acreage	3,451,086	3,451,086	--

Note: Ornamentals were included in "Other Areas" in 2003.

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Water Quality Analyses

Table A-2: Land Use Categories, Unit Load Factors, and P Reduction Factors

Landuse Category	FLUCCS Description	Unit Load (lbs/acre/ yr)	Owner Implemented BMPs	Typical Cost Share BMPs	Additional Ag. Practices
Urban	Mobile Home Units	0.66	2.5%	0%	0%
	Residential Low Density				
	Residential Medium Density				
	Residential High Density				
Improved Pastures	Improved Pastures	0.72	11%	19%	49%
Unimproved	Unimproved Pastures	0.49	7%	13%	44%
Woodland Pastures/Rangeland	Woodland Pastures/Rangeland	0.27	4%	6%	35%
Row Crops	Row Crops	6.3	30%	30%	50%
Sugarcane	Field Crops - Sugarcane	0.63	10%	23%	52%
Citrus	Citrus	1.62	12%	20%	42%
Sod	Sod Farms	2.52	20%	27%	50%
Ornamentals	Ornamentals	4.1	32%	35%	50%
Tree Plantations	Tree Plantations/Pine	0.18	1%	10%	50%
Natural Areas	Water	0.2	0%	0%	0%
	Wetlands				
Other Areas	Field Crops	0.7	10%	0%	0%
	Aquaculture				
	Fallow Crop Land				

Water Quality Analyses

- **Baseline Data**
- **Current Activities (Levels 1 and 2)**
- **Alternatives – Combinations of Load Reduction Management Measures (Levels 3 through 5)**

Water Quality Analyses

■ Baseline Data

- Basin Name
- Landuse and Area (acres)
- Estimated Unit P Load for each Landuse (lb/ac)
- Estimated Annual P Load for each Landuse (t)
- Measured Annual P Load per Basin (t)
- Calculated Annual P Load for each Landuse (t)

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Water Quality Analyses

Watershed Baseline Data

SUMMARY BASIN	AREA (acres)	Basin Unit P Load (lb/ac)	Estimated Annual Basin P Load (lbs)	Estimated Annual Basin P Load (Mtons)	Average Annual P Load (1991 2005) (Mtons)
<i>Fisheating Creek</i>	289,366		139,338	63.335	54.703
Citrus	12512	1.620	20,270	9.195	7.941
Dairy	26	3.380	88	0.040	0.035
Improved Pasture	80869	0.720	58,226	26.411	22.811
Natural Areas	114046	0.200	22,809	10.346	8.936
Ornamentals	541	4.100	2,219	1.007	0.869
Other Areas	4583	0.700	3,208	1.455	1.257
Row Crops	212	6.300	1,335	0.606	0.523
Sod Farms	2448	2.520	6,168	2.798	2.417
Sugarcane	2326	0.630	1,465	0.665	0.574
Tree Plantations	17835	0.180	3,210	1.456	1.258
Unimproved Pasture	18752	0.490	9,189	4.168	3.600
Woodland/Rangeland	31007	0.270	8,372	3.798	3.280
Urban	4208	0.660	2,777	1.260	1.088

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Water Quality Analyses

- **Baseline Data**
- **Current Activities (Levels 1 and 2)**
- **Alternatives – Combinations of Load Reduction Management Measures (Levels 3 through 5)**

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Water Quality Analyses

- **Current Activities at Field Level**
 - **Owner Implemented BMPs**
 - **Typical Cost Share BMPs**
 - **Additional Agricultural BMPs**
- **Current Activities at Basin Level**
 - **Watershed Phosphorus Control Projects**
 - **Regional Public Works Projects**
 - **Other Regional Projects**

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Water Quality Analyses

Example Basin	AREA (acres)	Average Annual P Load (1991 2005) (Mtons)	Owner Implemented BMPs (1)	
			Load Red. (Mtons)	Remain. Load (Mtons)
<i>Fisheating Creek</i>	289,366	54.703	4.990	49.713
Citrus	12512	7.941	0.953	6.988
Dairy	26	0.035	0.003	0.032
Improved Pasture	80869	22.811	2.509	20.302
Natural Areas	114046	8.936	0.000	8.936
Ornamentals	541	0.869	0.278	0.591
Other Areas	4583	1.257	0.126	1.131
Row Crops	212	0.523	0.157	0.366
Sod Farms	2448	2.417	0.483	1.933
Sugarcane	2326	0.574	0.057	0.517
Tree Plantations	17835	1.258	0.013	1.245
Unimproved Pasture	18752	3.600	0.252	3.348
Woodland/Rangeland	31007	3.280	0.131	3.149
Urban	4208	1.088	0.027	1.061

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Water Quality Analyses

- **Current Activities at Field Level**
 - Owner Implemented BMPs
 - Typical Cost Share BMPs
 - Additional Agricultural BMPs
- **Current Activities at Basin Level**
 - Watershed Phosphorus Control Projects
 - Regional Public Works Projects
 - Other Regional Projects

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Water Quality Analyses

Example Basin	Average Annual P Load (Measured) (1991-2005) (Mtons)	Funded Typ. Cost-Share BMPs (2)	Watershed P Control Projects (3)	
		Remain. Load (Mtons)	Load Red. (Mtons)	Remain. Load (Mtons)
C-40 Basin (S-72)	12.36	10.66	0.20	10.46
C-41 Basin (S-71)	38.07	32.89	1.50	31.39
C41A Basin (S-84)	13.85	11.80	0.00	11.80
S-308C (St. Lucie-C-44)	12.92	11.47	0.00	11.47
East Caloosahatchee (S-77) ***	1.00	1.00	0.00	1.00
L-8 Basin (Culv 10A)	7.40	6.98	0.00	6.98
Total	513.83	441.91	31.71	410.20
Adjusted Reductions to the Lake			31.71	

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Water Quality Analyses

- **Baseline Data**
- **Current Activities (Levels 1 and 2)**
- **Alternatives – Combinations of Load Reduction Management Measures (Levels 3 through 5)**


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Water Quality Analyses

- **Alternative 1 – Common Element**
Contains Levels 1 and 2 MMs, plus certain Levels 3 and 4 MMs
- **Alternatives 2 through 4 are independent, but they are additive to Alternative 1**

Subwatershed	Average Annual P Load (Measured)(1991-2005) (Mtons)	Other Regional Projects (7) Adjusted Remain. Load* (Mtons)	Alternative #1 Load Reduction Management Measures (8)		
			Load Red. (Mtons)	Remain. Conc. (ppb)	Adjusted Remain. Load* (Mtons)
Upper Kissimmee (S-65)**	91	78	4	63	74
Lower Kissimmee (S-65A,B,C,D,E)	77	21	8	29	14
Taylor Creek/Nubbin Slough (S-191,154,133,135)	124	42	15	113	26
Lake Istokpoga (S-68)**	23	23	0	63	23
Indian Prairie Basins (12 basins)	89	51	36	50	15
Fisheating Creek & Nicodemus Slough (Culv 5)	55	39	0	143	39
West Lake Okeechobee Basin (S-77) ***	1	1	0	139	1
EAA Basins	33	12	0	66	12
East Lake Okeechobee Basins (C-44, L-8)	20	8	0	57	8
Total Reductions to the Lake	514	275	62	67	213
TMDL (not including 35 t of atmospheric deposition)		105			105
Remaining Load		170			108


SOUTH FLORIDA WATER MANAGEMENT DISTRICT					
Subwatershed	Average Annual P Load (Measured)(1991-2005) (Mtons)	Alternative #1 Load Reduction Management Measures	Alternative #4 Load Reduction Management Measures (11)		
		Adjusted Remain. Load* (Mtons)	Load Red. (Mtons)	Remain. Conc. (ppb)	Adjusted Remain. Load* (Mtons)
Upper Kissimmee (S-65)**	91	74	14	51	60
Lower Kissimmee (S-65A,B,C,D,E)	77	14	0	30	14
Taylor Creek/Nubbin Slough (S-191,154,133,135)	124	26	14	52	12
Lake Istokpoga (S-68)**	23	23	9	38	14
Indian Prairie Basins (12 basins)	89	15	1	46	14
Fisheating Creek & Nicodemus Slough (Culv 5)	55	39	18	78	21
West Lake Okeechobee Basin (S-77) ***	1	1	0	139	1
EAA Basins	33	12	3	52	10
East Lake Okeechobee Basins (C-44, L-8)	20	8	0	57	8
Total Reductions to the Lake	514	213	59	49	154
TMDL (not including 35 t of atmospheric deposition)		105			105
Remaining Load		108			49



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Water Quality Analyses

- Summary
 - Three Spatial Scales: field, basin, and subwatershed
 - Five Levels of Management Measures
 - BMPs were applied at field scale
 - Local and regional projects were related to basin or subwatershed scale



Water Quality Analyses

■ Summary (cont.)

- Baseline Condition (based on measurement)
- Current Activities (Levels 1 and 2)
- Reduction Alternatives –
Combinations of Load Reduction
Management Measures (Levels 3
through 5)



St. Lucie River Watershed Protection Plan
DRAFT Management Measures
1/15/2008

MM #	Project Feature/Activity	Level
1	Harmony Heights Subdivision (Phase II – V)	1
2	White City Canal D	1
3	White City Drainage Improvements (Citrus/Saeger)	1
4	White City Drainage Improvements (canals B, C, E, F, G)	2
5	Paradise Park Stormwater Improvements (Phase III – V construction)	1
6	Indian River Estates/Savannas Ecosystem Management Project	1
7	Platt's Creek Wetland Restoration	2
8	Indian River Drive Stormwater Outfall Retrofits	1
9	Natural Lands in IRL-S CERP Project	2
10	St. Lucie Watershed Natural Area Registry Program	1
11	Creation of suitable oyster substrate in the St. Lucie Estuary	2
12	Increased retention/detention areas within the C-23 and C-24 Basins	5
13	Routine Inspection of Septic Systems	
14	Removal of Accumulated Muck in the St. Lucie River and Estuary	
15	On-site remediation of selected sludge application areas	5
16	Improved management of sludge disposal in St. Lucie County through the use of an innovative technology (Plasma-Arc)	2
17	Identification of water quality "hot-spots" in watershed	
18	Reservoir and/or Stormwater Treatment Area along the south side of the C-44 Canal	5
19	Conversion of existing canals into "linear wetland treatment areas"	3
20	Increased use of Xeriscaping in new residential and commercial construction	
21	Funding Partnership with St. Lucie River Issues Team (SLRIT)	5
22	North River Shores Vacuum Sewer System	
23	CERP - IRL South: PalMar Complex - Natural Storage and Water Quality Area	1
24	CERP - IRL South: C-23/24 Reservoir/STA	1
25	CERP - IRL South: Allapattah Complex - Natural Storage and Water Quality Area	1
26	CERP - IRL South: Northfork Natural Floodplain Restoration	1
27	CERP - IRL South: Muck Remediation and Artificial Habitat	1
28	Tropical Farms Roebuck Creek Stormwater Quality Retrofit	
29	Old Palm City Phase III Stormwater Quality Retrofit	
30	Manatee Pocket Dredging Project	
31	Stormwater Baffle Box Retrofit - City of Stuart	
32	Old Palm City/Danforth Creek Stormwater Quality Retrofit	
33	North St. Lucie River Water Control District Stormwater Retrofit; Structures 81-1-2 and 85-1-2	
34	Indiantown Citrus Growers Water Conservation Project, Phase II	
35	All American Boulevard Ditch Retrofit	
36	Everglades Comprehensive Plan Amendment	
37	Living Shoreline Initiative	

Northern Everglades- Potential Management Measure

Project Feature/Activity: Harmony Heights Subdivision (Phase II – V)

Level: 1

General Description/Background: 300+ acres platted in the 1950's with unimproved roads and lack of modern stormwater system. Improvements could be made to the existing system to improve water quality and reduce quantity of peak discharge.

Purpose: Reduce quantity of peak flow and improve quality of storm water discharged to Indian River Lagoon.

Location/Size/Capacity: This site is in Fort Pierce, Florida and is generally located between the C-25 Canal and the Fort Pierce Farms Water Control District Canal #1. The project will provide ~19.4 acre-ft of dry retention with associated conveyance features.

Initiative Status: Approved and on-going by St. Lucie County

Cost: \$1.2 Million

Documentation: Master Plan, Comprehensive Everglades Restoration Plan, SWIM Plan, TMDL efforts.

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely: (Reductions) 60% - 80% TSS (4300 lb/yr); 50%-80% TP; 30% - 80% TN; 40% - 80% BOD/COD
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely: 10 year/24 hour design storm produces 153 acre-ft of run-off
- Level of Certainty:
- Assumptions:

Contact: Jason Bessey, Stormwater Program, St. Lucie County Public Works, 772-462-1668

Northern Everglades- Potential Management Measure

Project Feature/Activity: White City Canal D

Level: 1

General Description/Background: Existing canal is currently running through a pasture. The canal could be relocated and retrofit to include a control structure.

Purpose: To improve water quality of storm water flows to the North Fork the St. Lucie River (NFSLR) by modifying canal stages and reducing the potential for pollutant run-off from pasture.

Location/Size/Capacity: The project is located in St. Lucie County adjacent to the NFSLR within a 50 acre basin.

Initiative Status: Approved and on-going by St. Lucie County

Cost: \$400,000

Documentation: Master Plan, CERP, SWIM, TMDL efforts

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely: (Reductions) ~10% coliform; 20% - 40% nutrients and solids
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact: Jason Bessey, Stormwater Program, St. Lucie County Public Works, 772-462-1668

Northern Everglades- Potential Management Measure

Project Feature/Activity: White City Drainage Improvements (Citrus/Saeger)

Level: 1

General Description/Background: Construction of 4 acre storm water detention pond with associated outfall structure

Purpose: Capture, store and treat run-off and provide controlled release to the St. Lucie River

Location/Size/Capacity: The project is in St. Lucie County at the intersection of Citrus and Saeger. The project would utilize a portion of a 50 acre basin.

Initiative Status: Approved and on-going by St. Lucie County

Cost: \$300,000

Documentation: Master Plan, CERP, SWIM, TMDL efforts

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely: (Reductions) 30% - 50% Nutrients and Solids
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely: Capture first 1" of run-off (~22 acre-ft)
- Level of Certainty:
- Assumptions:

Contact: Jason Bessey, Stormwater Program, St. Lucie County Public Works, 772-462-1668

Northern Everglades- Potential Management Measure

Project Feature/Activity: White City Drainage Improvements (canals B, C, E, F, G)

Level: 2

General Description/Background: Improve/retrofit various direct discharges to St. Lucie River from basin

Purpose: Capture, store and treat stormwater run-off using modern storm systems and Best Management Practices

Location/Size/Capacity: Various locations within the 50 acre basin

Initiative Status: approved and pending authorization; will most likely result in multiple small retrofits in area

Cost: \$3 Million

Documentation: Master Plan, CERP, SWIM, TMDL efforts

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely: (Reductions) 30% - 50% nutrients and solids
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely: tbd
- Level of Certainty:
- Assumptions:

Contact: Jason Bessey, Stormwater Program, St. Lucie County Public Works, 772-462-1668

Northern Everglades- Potential Management Measure

Project Feature/Activity: Paradise Park Stormwater Improvements (Phase III – V construction)

Level: 1

General Description/Background: Construction of modern stormwater system including swales, ponds, treatment areas and associated structures.

Purpose: To provide improved stormwater treatment and conveyance .

Location/Size/Capacity: The project is in St. Lucie County and is located in a 170 acre residential basin at the convergence of the C-25 Canal, FPFWCD Canal #1 and Taylor Creek.

Initiative Status: 1

Cost: \$5.2 Million

Documentation: Master Plan, CERP, SWIM, TMDL efforts

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely: (Reductions) 65% nutrients; 90%-95% solids
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely: designed for 10 year/24 hour event with 90%-95% storage (will treat 75% of first 1")
- Level of Certainty:
- Assumptions:

Contact: Jason Bessey, Stormwater Program, St. Lucie County Public Works, 772-462-1668

Northern Everglades- Potential Management Measure

Project Feature/Activity: Indian River Estates/Savannas Ecosystem Management Project

Level: 1

General Description/Background: Construction of a pump station, infrastructure and water detention cells to manage and treat run-off from a 1200 acre residential basin

Purpose: To improve flood control and treat stormwater that currently discharges directly to the Indian River Lagoon and North Fork of the St. Lucie River

Location/Size/Capacity: The project is a 1200 acre basin in St. Lucie County adjacent to the Savannas Preserve and Indian River Lagoon

Initiative Status: approved and on-going by St. Lucie County

Cost: \$8 Million

Documentation: Master Plan, CERP, SWIM, TMDL efforts

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely: (Reductions) 100 % gross solids; 90% solids/coliforms; 50% TN (Alum enhancement proposed)
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely: 32 acre-feet of storage
- Level of Certainty:
- Assumptions:

Contact: Jason Bessey, Stormwater Program, St. Lucie County Public Works, 772-462-1668

Northern Everglades- Potential Management Measure

Project Feature/Activity: Platt's Creek Wetland Restoration

Level: 2

General Description/Background: Convert and restore a citrus operation to floodplain forest, marsh and flatwoods. Also create depression marshes/wetlands for "polishng" of run-off

Purpose: To restore and preserve the native habitat along the shoreline of the North Fork of the St. Lucie River

Location/Size/Capacity: The project is in St. Lucie County located north of Platt's Creek tributary and east of the river

Initiative Status: Approved and in design by St. Lucie County

Cost: \$3 Million

Documentation: Master Plan, CERP, SWIM, TMDL efforts

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely: (Reductions) ~20% nutrients
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely: attenuate run-off through system
- Level of Certainty:
- Assumptions:

Contact: Jason Bessey, Stormwater Program, St. Lucie County Public Works, 772-462-1668

Northern Everglades- Potential Management Measure

Project Feature/Activity: Indian River Drive Stormwater Outfall Retrofits

Level: 1

General Description/Background: Currently over 150 outfalls discharge directly to the Indian River Lagoon from the surrounding Indian River Drive residential area. The existing system could be retrofit with modern baffle boxes to improve control of gross solids and sediments

Purpose: Improve water quality of run-off to Indian River Lagoon by reducing solids and sediments with modern baffle boxes

Location/Size/Capacity: The project is located on Indian River Drive in St. Lucie County

Initiative Status: Approved and on-going by St. Lucie County (multiple small retrofit projects each year)

Cost: \$4.5 Million

Documentation: Master Plan, CERP, SWIM, TMDL efforts

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely: (Reductions) 90% gross solids; 20% - 30% nutrients
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum: N/A
- Maximum: N/A
- Most Likely: N/A
- Level of Certainty: N/A
- Assumptions: N/A

Contact: Jason Bessey, Stormwater Program, St. Lucie County Public Works, 772-462-1668

Northern Everglades- Potential Management Measure

Project: Natural Lands in IRL-S CERP Project

Level: 2

Description: The recommended plan includes a component called natural storage areas. These are currently drained pasture lands that will be hydrologically restored to provide a variety of project benefits. The purposes of the natural areas have been identified for use as alternative storage, rehydration, and habitat restoration. This land currently consists primarily of native and improved pasture. Some of the existing land is classified as wetlands, and the remainder of the land is classified as a type of upland. The natural areas have been broken down into three components. These include: Palmar Area, Allapattah Area, and Cypress Creek/Trail Ridge Area.

Purpose: By restoring the natural hydropattern in these areas, large volumes of water that now rapidly drain off these lands can be retained in wetlands. The natural areas will provide approximately 30,000 acre-feet of freshwater storage for the project through this onsite retention of stormwater. Onsite retention in these areas will also reduce phosphorus and nitrogen loads to the estuaries while providing increased spatial extent of natural wetlands and upland habitat for wildlife. Finally, onsite retention will recharge the superficial aquifer.

Location/Size/Capacity: 92,000 acres in Martin, St. Lucie, and Okeechobee Counties

Initiative Status: Approximately 30,000 acres have been protected through mitigation programs, conservation easements, and acquisition. There are 62,000 acres remaining to be protected through this project.

Cost: TBD. We note that land values reflected in the current real estate market may provide an opportunity for protection now before property values escalate.

Documentation: For more information, please see the IRL-S PIR. Additional assessment of this project has been vetted through public agencies in the South Florida Ecosystem Restoration Task Force's Natural Lands Report provided to Congress in 2006.

Estimate of Water Quality Benefits:

Minimum –

Maximum-

Most Likely-

Level of Certainty- conceptual/final/unknown

Assumptions leading to benefit estimate

Estimate of Water Quantity Benefits:

Minimum –

Maximum-

Most Likely-
Level of Certainty- conceptual/final/unknown
Assumptions leading to benefit estimate

Contact: TNC

Northern Everglades- Potential Management Measure

Project: St. Lucie Watershed Natural Area Registry Program

Level: 2

Description: A natural area registry program is a voluntary program designed to provide support for protecting the watershed's natural lands. The voluntary cooperation of a landowner to protect the natural elements, features, and characteristics of their own property is the basis for natural area registry programs. Through a "handshake" agreement the landowner agrees to conserve his or her land to the best of their abilities. In return, they can receive a survey of the plants, animals, and natural features on the property and be provided information on stewardship practices.

Purpose: The purpose of the natural areas registry is to protect and conserve natural lands within the St. Lucie watershed; educate landowners about the natural resource values and the value in protecting them; establish and maintain a relationship with landowners to assure that communication channels are kept open for sharing information about land values, land availability, conservation options, landowner appreciation, etc.

Location/Size/Capacity: Natural lands within the St. Lucie River watershed.

Initiative Status:

Cost: TBD. There would be only program cost as this is not a construction project or a land acquisition project.

This program could also be coordinated with the FWC Florida Landowner Incentive Program (LIP) which works with private landowners to educate and encourage land management activities that will maintain or enhance habitat conditions that benefit the needs of listed species. This is a 50% cost share program. Management practices could include hydrology enhancement projects, mechanical & chemical vegetation treatments, native vegetation restoration and prescribed fire.

A possible federal funding source is the NRCS Wildlife Habitat Incentives Program. This is a voluntary program that provides technical and financial assistance to landowners and others to develop upland, wetland, riparian and aquatic habitat. The focus in Florida is to enhance or restore native vegetative communities and to conserve declining or imperiled species. While funding for this program is unavailable in the present budget, it is an option for future years of the St. Lucie Watershed Protection Plan.

Documentation: The Nature Conservancy is a partner in similar programs in other states and can provide additional information. This is a non-binding, voluntary program.

Estimate of Water Quality Benefits:

Minimum –

Maximum-

Most Likely-

Level of Certainty- conceptual/final/unknown

Assumptions leading to benefit estimate

Estimate of Water Quantity Benefits:

Minimum –

Maximum-

Most Likely-

Level of Certainty- conceptual/final/unknown

Assumptions leading to benefit estimate

Contact: TNC

Northern Everglades- Potential Management Measure

Project Feature/Activity: Creation of suitable oyster substrate in the St. Lucie Estuary

Level: 2

General Description/Background: Build upon existing efforts to create suitable oyster substrate in the St. Lucie Estuary using natural or made-made conditions (i.e. “oyster balls”, limestone rocks, relict shell bags, etc.) placed under docks or on open slopes. (NOTE: previous efforts have indicated that a total of 180 acres of artificial habitat should be created in the SLE via this means: 135 acres of oyster shell hash and 45 acres of prefabricated reef balls)

Purpose: Established oyster reefs provide many ecological benefits including improvement of water quality. Oysters are a vital species in achieving restoration of the St. Lucie Estuary. They are a key indicator of the health of the system and are also very effective bio-filters of fine sediments and nutrients in the water column. Creating additional oyster habitat area is essential because it aids in the restoration process by providing a location for oyster larvae to settle thus increasing the population filtering base. In addition, the St Lucie could use some substrate to help jumpstart the oyster recruitment process. Currently, there are very few acres of oyster reefs remaining.

Location/Size/Capacity: Ultimately, nine sites in the middle estuary could be created. Each site could be approximately 20 acres in area and could include 15 acres of shell hash and 5 acres of prefabricated 2-foot diameter concrete reef balls.

Initiative Status: 4 existing projects by Martin County, future projects possible pending funding. Although this management measure was included in the Final PIR for IRL-South, it was not included in the Chief of Engineer’s Report or WRDA 2007. This is a critical measure to ensure habitat restoration. Substrate is a limiting factor in the SLE and is declining each year.

Cost: tbd

Documentation: CERP Indian River Lagoon – South PIR

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely: tbd
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum: N/A
- Maximum: N/A
- Most Likely: N/A
- Level of Certainty: N/A
- Assumptions: N/A

Contact: Kathy Fitzpatrick, P.E., Martin County, 772-288-5595

Northern Everglades- Potential Management Measure

Project Feature/Activity: Increased retention/detention areas within the C-23 and C-24 Basins

Level: 5

General Description/Background: Stormwater retention/detention ponds provide environmental benefits by capturing and treating run-off prior to discharging into the natural systems downstream. Increasing the amount of stormwater ponds in these basins could provide significant WQ and salinity improvements in the St. Lucie River and Estuary

Purpose: To reduce the magnitude of peak discharges and improve the quality of water discharged to the St. Lucie River and Estuary

Location/Size/Capacity: tbd

Initiative Status: conceptual planning

Cost: tbd

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact: South Florida Water Management District

Northern Everglades- Potential Management Measure

Project Feature/Activity: Routine Inspection of Septic Systems

Level:

General Description/Background: Existing problems with the areas septic systems could be identified and corrected through a routine inspection process.

Purpose: To reduce the amount of water quality problems related to damaged or non-functioning septic systems

Location/Size/Capacity: tbd

Initiative Status: conceptual

Cost: tbd

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact: County Health Department

Northern Everglades- Potential Management Measure

Project Feature/Activity: Removal of Accumulated Muck in the St. Lucie River and Estuary

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact:

Northern Everglades- Potential Management Measure

Project Feature/Activity: On-site remediation of selected sludge application areas

Level: 5

General Description/Background: The disposal of sludge in certain areas may cause adverse water quality problems to natural downstream areas. Due to the excessive amount of sludge disposed in some critical areas, the potential exists that this area will continue to be a source of pollutants for many years. This amount of time can be reduced by providing on-site remediation of selected disposal areas (chemical application and treatment, etc)

Purpose: To reduce the water quality impact from previous sludge disposal area

Location/Size/Capacity: tbd (all areas will be ranked and the most critical locations will be remediated first)

Initiative Status: conceptual

Cost: tbd

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact: South Florida Water Management District, Florida Department of Environmental Protection

Northern Everglades- Potential Management Measure

Project Feature/Activity: Improved management of sludge disposal in St. Lucie County through the use of an innovative technology (Plasma-Arc)

Level: 2

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact:

Northern Everglades- Potential Management Measure

Project Feature/Activity: Identification of water quality “hot-spots” in watershed

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact:

Northern Everglades- Potential Management Measure

Project Feature/Activity: Reservoir and/or Stormwater Treatment Area along the south side of the C-44 Canal to capture and treat any remaining undesired releases from Lake Okeechobee to the St. Lucie River and Estuary not addressed by the proposed improvements north of the lake.

Level: 5

General Description/Background: The proposed projects in the Lake Okeechobee Protection Plan will provide significant reduction in the amount of undesirable discharges from the lake to the estuary. Any remaining undesirable discharges could be addressed through the construction of a reservoir and/or stormwater treatment area to capture and treat these remaining lake discharges.

Purpose: To provide storage and treatment of water that is discharged from the lake to the estuary at undesirable times and amounts.

Location/Size/Capacity: tbd

Initiative Status: conceptual

Cost: tbd

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact: South Florida Water Management District

Northern Everglades- Potential Management Measure

Project Feature/Activity: Conversion of existing canals into “linear wetland treatment areas”
(i.e. similar to St. James Canals)

Level: 3

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact:

Northern Everglades- Potential Management Measure

Project Feature/Activity: Increased use of Xeriscaping in new residential and commercial construction

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact:

Northern Everglades- Potential Management Measure

Project Feature/Activity: Funding Partnership with St. Lucie River Issues Team (SLRIT)

Level: 5

General Description/Background: The St. Lucie River Issues Team Funding Initiative is a very successful example of local partnerships working together to prioritize issues, procure federal and state funding, and implement “turn dirt” projects that have quantifiable results and positive effect on the resource. The new Northern Everglades legislation could be used to build upon these existing funding partnerships

Purpose: To increase the amount of water quality improvement projects that are implemented through the St. Lucie River Issues Team Funding Initiative.

Location/Size/Capacity: tbd (utilize existing project list of the SLRIT)

Initiative Status: conceptual

Cost: tbd

Documentation: St. Lucie River Issues Team – DRAFT Funding Initiative and Progress Report 1999-2008

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact: Kathy LaMartina, South Florida Water Management District, 772-223-2600

Northern Everglades- Potential Management Measure

Project Feature/Activity: North River Shores Vacuum Sewer System

Level:

General Description/Background: Vacuum assisted gravity sewer collection system to provide service to approximately 730 single and multi family residential units.

Purpose: Septic Tank Elimination

Location/Size/Capacity: Along the banks of the east side of the North Fork of the St. Lucie River, North of the Roosevelt Bridge, West of U.S. 1 and South of Britt Road. To service approximately 730 single and multi-family residential units, presently disposing of approximately 190,000 gallons per day of waste through septic tanks.

Initiative Status:

Cost: approximately \$10,000,000 (estimate as of 3/28/06)

Documentation: 60% construction drawings and St. Lucie River Septic Tank/Water Quality Study from the Harbor Branch Oceanographic Institution.

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact: Additional information regarding loading is available in the Harbor Branch Oceanographic Institute June 2006 report

Northern Everglades- Potential Management Measure

Project Feature/Activity: CERP - IRL South: PalMar Complex - Natural Storage and Water Quality Area

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact:

Northern Everglades- Potential Management Measure

Project Feature/Activity: CERP - IRL South: C-23/24 Reservoir/STA

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact:

Northern Everglades- Potential Management Measure

Project Feature/Activity: CERP - IRL South: Allapattah Complex - Natural Storage and Water Quality Area

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact:

Northern Everglades- Potential Management Measure

Project Feature/Activity: CERP - IRL South: Northfork Natural Floodplain Restoration

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact:

Northern Everglades- Potential Management Measure

Project Feature/Activity: CERP - IRL South: Muck Remediation and Artificial Habitat

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact:

Northern Everglades- Potential Management Measure

Project Feature/Activity: Tropical Farms Roebuck Creek Stormwater Quality Retrofit

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact: Martin County

Northern Everglades- Potential Management Measure

Project Feature/Activity: Old Palm City Phase III Stormwater Quality Retrofit

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact: Martin County

Northern Everglades- Potential Management Measure

Project Feature/Activity: Manatee Pocket Dredging Project

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact: Martin County

Northern Everglades- Potential Management Measure

Project Feature/Activity: Stormwater Baffle Box Retrofit - City of Stuart

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact: City of Stuart

Northern Everglades- Potential Management Measure

Project Feature/Activity: Old Palm City/Danforth Creek Stormwater Quality Retrofit

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact: Martin County

Northern Everglades- Potential Management Measure

Project Feature/Activity: North St. Lucie River Water Control District Stormwater Retrofit;
Structures 81-1-2 and 85-1-2

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact: North St. Lucie River Water Control District

Northern Everglades- Potential Management Measure

Project Feature/Activity: Indiantown Citrus Growers Water Conservation Project, Phase II

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact: Treasure Coast RC&D Council

Northern Everglades- Potential Management Measure

Project Feature/Activity: All American Boulevard Ditch Retrofit

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact: Martin County

Northern Everglades- Potential Management Measure

Project Feature/Activity: Everglades Comprehensive Plan Amendment

Level: 2

General Description/Background: The Florida Department of Community Affairs (DCA) is leading an effort to ensure that county comprehensive plans include environmental protection for the Everglades. An amendment has been drafted, and is currently being revised, which states that for the areas within the jurisdiction of the South Florida Water Management District each comprehensive plan shall include goals, objectives and policies that ensure protection of the land, water, and biological resources necessary for the long-term viability of the Florida Everglades. The goals, objectives and policies to protect the Florida Everglades shall be adopted into comprehensive plans within one year of the effective date of this law.

Purpose: This amendment will require comprehensive plans to include: a conservation element for the conservation, use, and protection of natural resources in the area, including air, water, water recharge areas, wetlands, waterwells, estuarine marshes, soils, beaches, shores, flood plains, rivers, bays, lakes, harbors, forests, fisheries and wildlife, marine habitat, minerals, and other natural and environmental resources.

Location/Size/Capacity: Areas within the jurisdiction of the South Florida Water Management District

Initiative Status: DCA is currently working within the legislative process to draft/revise this amendment.

Cost: N/A

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:

- Level of Certainty:
- Assumptions:

Contact: TNC

Northern Everglades- Potential Management Measure

Project Feature/Activity: Living Shoreline Initiative

Level: 4 or 5

General Description/Background: The goal of a Living Shoreline Initiative is to establish living shorelines as the primary means of erosion prevention in the coastal areas of the St. Lucie estuary. This is a partnership effort that will be modeled after the Living Shoreline Initiative established by the Florida Panhandle Coastal Program.

In the Panhandle program, partners include: Apalachicola Riverkeeper, Choctawhatchee Basin Alliance, Florida Department of Environmental Protection (Ecosystem Restoration Section, and Office of Coastal and Aquatic Managed Areas), Florida Fish and Wildlife Conservation Commission, National Oceanic and Atmospheric Administration, PBS&J, Pensacola Gulf Coast Keepers, Sea Grant Extension, University of Florida, University of West Florida, U.S. Fish and Wildlife Service, and West Florida Regional Planning Council.

Purpose: To protect shorelines from erosion using native vegetation rather than armoring. Living shorelines create nursery and foraging habitat, enhance natural processes and improve water quality.

Location/Size/Capacity: TBD

Initiative Status: Similar project is currently underway in the Florida Panhandle.

Cost:

Documentation: “A Living Shoreline Initiative for the Florida Panhandle: Taking a Softer Approach,” Melody Ray Culp, USFWS, National Wetlands Newsletter, vol. 29, no. 6, Copyright 2007.

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:

- Most Likely:
- Level of Certainty:
- Assumptions:

Contact: TNC and USFWS

Northern Everglades- Potential Management Measure

Project Feature/Activity:

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact:

Northern Everglades- Potential Management Measure

Project Feature/Activity:

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact:

Northern Everglades- Potential Management Measure

Project Feature/Activity:

Level:

General Description/Background:

Purpose:

Location/Size/Capacity:

Initiative Status:

Cost:

Documentation:

Estimate of Water Quality Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Estimate of Water Quantity Benefits

- Minimum:
- Maximum:
- Most Likely:
- Level of Certainty:
- Assumptions:

Contact: